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Dispensing device.

The present invention relates to a dispensing device for dispensing a liquid or viscous substance, preferably foodstuff, wherein at least one pump means is provided to perform pump motions for sucking said substance into the dispensing device and dispense or discharge it therefrom.

Dispensing devices for dispensing or discharging viscous foodstuff are known from US 5 452 826. Such dispensing devices comprise a pump means which during a pump stroke sucks foodstuff out of an inner container and which during a reversed pump stroke discharges foodstuff.

Such a dispensing device has a limited pump speed, because after every discharge or outfeed one has to wait until the pump means has refilled the pump chamber.

The object of the present invention is to provide a dispensing device permitting a higher pump speed than what previously has been possible to reach at similar dispensing devices. This is arrived at according to the invention by providing it with the characterizing features of subsequent claim 1.

Since the dispensing device according to the invention during a return movement of the pump means transfers the substance from a suction chamber to a dispensing chamber, the dispensing or discharging speed may be substantially increased, which might be a great advantage when the dispensing device is used on stressy occasions in e.g. snack bars, restaurants or similar.

The invention will be further described below with reference to the accompanying drawings, in which

figure 1 is a perspective view of a dispensing device according to the invention;

figure 2 is a sectional view of the dispensing device of figure 1; and

figures 3 and 4 illustrate schematically how the dispensing device of figures 1 and 2 operates at different pump strokes.

2.

The dispensing device 1 illustrated in the drawings is adapted for dispensing or discharging a liquid or semi-liquid substance 2 and comprises a dispensing or discharge housing 3 with a pump means 4. The pump means is provided to perform pump motions for sucking substance 2 out of a container 5 and through a hose 6 or a similar conduit to the discharge housing 3, and for dispensing or discharging the substance 2 in the discharge housing 3 from said housing.

10 The liquid or viscous substance 2 may be foodstuff, e.g. mustard, ketchup, mayonnaise, dressing, cooking oil or similar and said foodstuff may be dispensed or fed out onto a dish, e.g. a hamburger or similar.

At the embodiment shown, the discharge housing 3 has a lower member 7 and an upper member 8 which are both substantially cup shaped. The pump means 4 may be located between the lower and upper members 7, 8, whereafter said members may be interconnected to a discharge housing 3 which is tight between the lower and upper members 7, 8 while the pump means 4 define a sealing therebetween.

The lower member 7 has a downwardly directed dispensing or discharge pipe 9 and an upwardly directed wall 10 which is annular, extends around and is preferably centered with an imaginary geometric centre line CL through the discharge housing 3. The wall 10 has at least one substance transfer opening 11 and preferably includes several such openings distributed around the centre line CL. The discharge pipe 9 may be eccentrically located relative to the centre line CL.

30 The upper member 8 has an upwardly directed sleeve 12 in which a piston means 13 is displaceably mounted and it also has a downwardly directed wall 14 of annular shape, extending around and preferably centered with the centre line CL. The wall 14 has at least one through-flow opening 15 for substance 2 and it has preferably the same diameter as the wall 10.

3.

The pump means 4 consists entirely or at least substantially of elastic material and includes an elastic dome shaped member 16 housed within the downwardly directed wall 14 of the upper member 8. The dome shaped member 16 has a radially outwardly directed flange 17 which extends out between the walls 10 and 14 and in between outer walls 18, 19 of the up- and downwardly directed walls 10, 14 of the dispensing or discharge housing 3, such that outer parts of the flange 17 provide a sealing between said outer walls 18, 19.

On the flange 17, at the outer periphery thereof, there is provided a valve body 21 for a first non-return valve 20 and this valve body 21 consists preferably of an elastic tongue. This tongue cooperates with a valve seat 22 which is designed as an edge around a substance inlet opening 23 through which substance 2 can be sucked into the discharge housing 3.

The first valve body 21 designed as a tongue can be brought to leave the valve seat 22 during suction of substance 2 into the discharge housing 3 and it can thereafter automatically return to engagement with the valve seat 22 for closing the substance inlet opening 23.

The pump means 4 further comprises a second non-return valve 24 having at least one valve body 25 which may be one or more members or designed as a downwardly directed sleeve. This valve body extends from peripheral parts of the dome shaped member 16 and is directed down into the lower member 7 immediately within its upwardly directed wall 10 and the substance transfer openings 11 therein. The edges around the substance transfer openings 11 define valve seats 26 for the valve body 25 and said valve body is provided to be brought to leave said valve seats 26 to let through substance 2 through said openings 11, and it may automatically return to its cooperation with the valve seats 26 for closing the substance transfer openings 11.

On the dispensing or discharge pipe 9 there may be

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provided a third non-return valve 27 which is provided to close said discharge pipe 9, but which can be opened by substance 2 pressing thereagainst for letting out said substance from the discharge housing 3. The third
5 non-return valve 27 may be adapted to prevent substance 2 from dripping from the dispensing or discharge housing 3 and it may consist of a hose member 28 which is inserted into or eventually threaded onto the discharge pipe 9 and which has a closed outer end 29. This outer end 29
10 can be opened by substance 2 pressing thereagainst and it may automatically return to the closed shape when the pressure from the substance 2 ceases.

The pump means 4 is provided to divide the inner parts of the dispensing device 1 into at least one suc-
15 tion chamber 30 and at least one dispensing or discharge chamber 31, which are interconnected through at least one transfer chamber 32. The pump means 4 is during a first pump motion in a direction A, during which the dome shaped member 16 is pressed from a position in the
20 upper member 8 to a lower position in the lower member 7, provided to suck substance 2 into the suction chamber 30 (arrow B, fig. 3) and at the same time discharge substance 2 from the discharge chamber 31 (arrow C, fig. 3). The pump means 4 is also provided to perform a second
25 pump motion in the opposite direction D (fig. 4) relative to the first pump motion in direction A. This second pump motion in direction D is reached while the dome shaped member 16 automatically returns from its position in the lower member 7 to its position in the upper member 8.
30 During this second pump motion in direction D of the pump means 4, substance 2 is fed from the suction chamber 30 and through the transfer chamber 32 into the dispensing or discharge chamber 31 (arrow E, fig. 4).

In order to permit substance 2 to flow through the
35 transfer chamber 32, the flange 17 extending across said chamber is provided with holes 17a through which substance 2 may pass.

5.

During the first pump motion in direction A of the pump means 4, the first non-return valve 20 is opened such that substance 2 may be sucked from the container 5 through the hose 6 or similar to the substance inlet opening 23 and therethrough into the suction chamber 30. At the same time, the second non-return valve 24 is closed and substance 2 is discharged from the discharge chamber 31 through the third non-return valve 27. During the movement in the opposite direction D of the pump means 4, the first non-return valve 20 is closed and substance 2 is pressed by the pump means 4 out of the suction chamber 30 and into the transfer chamber 32 such that the second non-return valve 24 is opened, whereby this substance 2 can be brought to flow into the discharge chamber 31. If there is a third non-return valve 27, this valve prevents air from being sucked into the discharge chamber 31 through the discharge pipe 9. This pump operation can be repeated until desired amounts of substance 2 have been pumped out to the desired number of products or locations.

The dispensing device 1 is preferably designed as a hand pump which can be held in one hand while at the same time pumping is carried through therewith, if necessary also with the other hand. The hand pump may comprise a handle 34 consisting of a first and a second handle member 35 and 36, whereby the first handle member 35 is rigidly connected with the upper member 8 of the dispensing or discharge housing 3 and preferably made integral therewith. The first handle member 35 may at least partly have a semicircular cross section such that one can locate parts of the hose 6 therein. Closest to the upper member 8, the handle member 35 may have a connection member 37 for tight connection of the end of the hose 6 to the upper member 8 such that the hose 6 communicates with the suction chamber 30.

The second handle member 36 is mounted on the first handle member 35 pivotable about an axis 38 such that it defines a lever with two shanks 39, 40 of which a first

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shank 39 can be held in one hand along with the first handle member 35 and be pressed up towards said first handle member 35 in order to perform pump motions. The second shank 40 pivot downwards when the first shank 39 is pressed upwards. The second shank 40 is provided to transfer said downward pivoting movement to the pump means 4 by cooperating with the piston means 13 for pressing it downwards and it may be bifurcated for cooperation with two flanges 41 which protrude in opposite directions from upper parts 42 of the piston means 13.

If it is heavy to perform a discharge or an outfeed with one hand by pressing the first shank 39 of the second handle member 36 upwards, one can use the other hand to press the second shank 40 downwards.

In order to provide sealing between the sleeve 12 and the piston means 13, there may be a sealing means 45 between said members which may consist of a sealing ring which is threaded onto the piston means.

Upper parts 42 of the piston means 13 may be situated above the sleeve 12 and they may include a downwardly directed pipe member 43 which is closed at the top. An inner wall of this pipe member 43 may cooperate displaceably with an outer wall of the sleeve 12.

The piston means 13 can be completely removed from the sleeve 12 for separate cleaning thereof.

For quick and easy assembly of the lower and upper members 7, 8 and quick and easy disassembly thereof, said members may have portions defining a bayonet mount or coupling 44. This bayonet mount 44 permits interconnection of the members 7, 8 by rotating one of said members relative to the other member in one direction, and disconnection by rotating said one member in the opposite direction.

The amount of substance 2 to be dispensed or discharged by means of the pump means 4 can be altered by replacing the piston means 13 with a piston means 13 having another length and/or diameter.

7.

At a particularly simple embodiment which is also easy to clean, the dispensing device 1 may comprise only four members which are easy to assemble and disassemble, namely the lower and upper members 7 and 8, the pump means 4 and the piston means 13. After disassembly or disconnection of the members, said members may be cleaned separately and easily reassembled. Eventually, there may be a fifth, easily removable member, namely the third non-return valve 27, which may consist of a simple and loosenable or detachable hose member 28.

The container 5 may be a flexible container, e.g. a plastic bag, which is designed to collapse when substance 2 is sucked out therefrom.

The invention is not limited to what is described above and illustrated in the drawings, but may vary within the scope of the following claims. As alternatives not described one should mention that the third non-return valve 27 is not absolutely necessary, that there may be more than one dispensing or discharge pipe 9 or similar, that the pump means 4 may be designed in other ways and that eventually a distributing device may be connected to the dispensing or discharge housing 3 for distributing substance 2 to many locations, e.g. six or eight locations, during each discharge or outfeed.